Amendments to the Drawings:

In FIG. 5, labels for the switches 4a, 4b, 1a, 1b and 7a have been provided for each of the associated switching signals in FIG. 5.

Attachment: One (1) drawing sheet containing FIG. 5 and replacing original sheet 3/6

REMARKS

In the Office Action dated January 29, 2009, the Examiner objects to the title of the invention and objects to the drawings. The Examiner also objects to claims 1-18. The Examiner rejects claims 1, 4, 5, 8, 9, 12, 13, 17 and 18 under 35 U.S.C. § 102(a) and rejects claims 1, 4, 13 and 18 under 35 U.S.C. §102(b). Finally, the Examiner indicates that claims 2, 3, 6, 7, 10, 11 and 14-16 would be allowable if rewritten or amended to overcome the objections thereto. With this Amendment, claims 1-6, 8-15, 17 and 18 are amended. No claims are canceled or added. After entry of this Amendment, claims 1-18 remain pending in the Application.

With this Amendment, Applicants propose a number of amendments to the specification to correct grammatical and/or typographical errors. Also, amendments have been made to conform portions of the specification to the claims as amended. Applicants respectfully submit that the changes are supported by the specification, drawings and claims as originally filed. Approval of the changes to the specification is requested.

Applicants have attached a replacement drawing sheet proposing corrections to FIG. 5. Specifically, these corrections include adding labels for the switches 4a, 4b, 1a, 1b and 7a to the associated switching signals illustrated in FIG. 5. These changes are supported by the description of the operation of the comparator on pages 4-6 of the Application as filed. Applicants respectfully requested the Examiner's approval and entry of amended FIG. 5.

The Examiner objects to the title, stating that it is not descriptive. Applicants submit that the claims are directed to a power converter and a control method for a power converter, so the title is descriptive. Applicants have, however, attempted to address the Examiner's concern by amending the title to "Power Converter and Control Method for a Power Converter Using Serially-Connected DC Power Sources." Applicants respectfully request withdrawal of the Examiner's objection to the title.

The Examiner objects to the drawings under 37 CFR 1.83(a), stating that the voltage command value compared to the lower carrier and the voltage command value compared to the upper carrier as recited in claim 14 must be shown or the features canceled from the claim.

Applicant respectfully submits that these features are shown in FIG. 5 as described in pages 4-6 of the specification. Withdrawal of the Examiner's objection to the drawings is respectfully requested.

The Examiner objects to claims 1-18 based on certain informalities. First, the Examiner states that claims 1-18 are confusing since "the voltage command" lacks antecedent basis. Applicants have amended independent claims 1 and 9 to include the feature of generating a voltage command indicative of a voltage to be applied to the load. This provides antecedent basis for the voltage command in claims 1 and 9 and in their dependent claims 2-8 and 10-12. Applicants have amended independent claim 13 to describe a voltage command generating portion configured to generate a voltage command indicative of a voltage to be applied to each of the three terminals of the three-phase load. This provides antecedent basis for the voltage command in claim 13 and in its dependent claims 14-18.

The Examiner states that claim 3 is confusing because the lower carrier and the upper carrier lack antecedent basis. Applicants have taken the Examiner's suggestion to amend claim 3 to depend from claim 2, providing antecedent basis for these terms in claim 2.

The Examiner states that claim 13 is confusing because "said voltage command generating portion" lacks antecedent basis. Applicants have removed this language from claim 13, rendering the Examiner's objection moot.

The Examiner states that claim 13 is confusing because "the switch between the positive and negative poles of the first DC power source" and "the switch between the positive and negative poles of the second DC power source" lack antecedent basis. Applicants have amended these phrases to read, respectively, "a switch connected between the positive pole and the negative pole of the first DC power source" and "a switch connected between the positive pole and the negative pole of the second DC power source."

Applicants respectfully submit that these amendments address the Examiner's objections to the claims. Withdrawal of the Examiner's objections is respectfully requested.

In addition to the foregoing amendments, Applicants have amended the claims to more particularly point out and distinctly claim the invention. These amendments are described

below in response to the Examiner's rejections.

Applicants gratefully acknowledge the indication of allowable subject matter in each of claim 2, 3, 6, 7, 10, 11 and 14-16. The Examiner indicates that these claims would be allowable if rewritten or amended to overcome the stated objections. Applicants have overcome the objections as described previously, but have not amended the claims to independent form as they are dependent from allowable claims as discussed in additional detail hereinafter.

The Examiner rejects claim 1 and its dependent claim 4 under 35 U.S.C. § 102(a) as being anticipated by Kitajima et al. (EP 1,615,325) and under 35 U.S.C. § 102(b) as being anticipated by Shekhawat et al. (US 4,670,828) and Mikami et al. (US 4,443,841). In addition to correcting antecedent basis for several terms in claim 1 as described above, claim 1 has been amended to clarify that the steps include switching a pole to be connected to the load by operating a switch between the positive and the negative poles of the first DC power source when the voltage command is lower than an electric potential of the negative pole of the second DC power source and operating a switch between the positive and the negative poles of the second DC power source when the voltage command is higher than the electric potential of the negative pole of the second DC power source.

Applicants respectfully submit that Kitajima et al. (EP 1,615,325) is not prior art to the present invention under 35 U.S.C. §102(a) because this invention has an International filing date of October 20, 2005, and has a priority date of October 21, 2004. Kitajima et al. published on January 11, 2006, after the invention by Applicants. Accordingly, that publication is also not prior art to the present invention. Applicants direct the Examiner's attention to related U.S. Pat. No. 7,122,991 to Kitajima et al., which was filed on July 6, 2005.

Shekhawat et al. discloses a bi-directional switch for use in neutral point clamped PWM inverters that is designed to minimize shoot-through without the use of long delays in switching time that result in the need for large snubber circuits to reducing resulting undesired harmonics. (Col. 1, ll. 34-60). The 3-phase neutral point clamped PWM inverter 10 of FIG. 1 converts DC power from first and second series-connected DC sources E1 and E2 into AC power for an AC load. (Col. 2, line 65- col. 3, line 2). Three pairs of main power switches Q1-Q6 are

coupled across bus 12 at the positive terminal of source E1 and bus 14 at the negative terminal of source E2. (Col. 3, ll. 2-5). Phase outputs Va, Vb and Vc developed at junctions 13a, 13b, 13c between the switches of each pair, which in turn are coupled to junction N between the first and second sources E1 and E2 at a midpoint voltage between the two sources E1, E2 using respective bi-directional switches 16, 18, 20. (Col. 3, ll. 9-16). PWM switch control circuit 76 controls power switches Q1 and Q2 and neutral or clamping switch Q7. (FIG. 4; col. 4, ll. 54-64). Using a frequency command to establish the fundamental frequency of the inverter output power, a current in the load flowing to or from junction 13a (that is, the output terminal) and an output voltage Va of the inverter near the load 26, switch control circuit 76 develops control signals for switches Q1, Q2 and Q7 to maintain the inverter output at or near specified parameter limits. (Col. 5, ll. 3-16). As can be seen from FIG. 4, the status of switch Q7 is used as an input to control switches 56, 58 of bi-directional switch 16.

While Shekhawat et al. discloses a power converter incorporating serially-connected DC power sources E1 and E2, the method of control described with respect to PWM switch control circuit 76 of Shekhawat et al. is significantly different from the method according to claim 1. More specifically, Shekhawat et al. fails to teach or suggest a method including the step of switching a pole to be connected to the load by operating a switch between the positive and the negative poles of the first DC power source when the voltage command is lower than an electric potential of the negative pole of the second DC power source and operating a switch between the positive and the negative poles of the second DC power source when the voltage command is higher than the electric potential of the negative pole of the second DC power source. Accordingly, claim 1 and its dependent claims 2-4 are allowable over Shekhawat et al.

Mikami et al. discloses four embodiments of a neutral-point-clamped PWM inverter including three (FIGS. 3, 7 and 8) where the DC power sources are connected in series. Each NPN transistor of respective switching means 26, 32, 38 and 42 receives a control signal at its base. (Col. 3, ll. 41-42, 52-53; col. 4, ll. 7-8, 11-12, 29-35). A control signal voltage may be obtained by making a fundamental wave component a desired value, nulling the value of a specific harmonic wave to be removed and determining a switching angle and a number of

switching operations. (Col. 4, ll. 36-55). The control signal is used to achieve PWM control and remove a specific harmonic although a conventional rectangular wave signal may be used. (Col. 4, ll. 55-60).

Mikami et al. fails to teach or suggest a method including the step of switching a pole to be connected to the load by operating a switch between the positive and the negative poles of the first DC power source when the voltage command is lower than an electric potential of the negative pole of the second DC power source and operating a switch between the positive and the negative poles of the second DC power source when the voltage command is higher than the electric potential of the negative pole of the second DC power source. Accordingly, claim 1 and its dependent claims 2-4 are allowable over Mikami et al.

Dependent claim 2 has been amended to clarify antecedent basis for several elements, and dependent claim 3 has been amended to depend from claim 2 as previously mentioned. Applicants respectfully submit that the amendments made do not affect the Examiner's indication of allowable subject matter in these claims.

Dependent claim 4 is amended to clarify antecedent basis and to more particularly point out and distinctly claim the subject matter recited therein. Claim 4 now describes generating a power distribution command based on a desired power distribution for at least the first and the second DC power sources and generating an AC voltage command based on the load, wherein generating the voltage command includes adding the AC voltage command to the power distribution command. Applicants respectfully submit that neither of the cited references teaches or suggests generating the voltage command of claim 1 by adding an AC voltage command to the power distribution command. Based on its dependence from claim 1 and based on the features recited therein, the invention of claim 4 is patentable over Shekhawat et al. and Mikami et al.

The Examiner rejects claim 5 and its dependent claim 8 under 35 U.S.C. § 102(a) as being anticipated by Kitajima et al. Applicants have amended claim 5 to clarify antecedent basis and include the steps of generating a voltage command indicative of a voltage to be applied to the load and switching a pole to be connected to the load by operating a switch between the

positive and the negative poles of the first DC power source by comparing the voltage command with a lower carrier and operating a switch between the positive and the negative poles of the second DC power source by comparing the voltage command with an upper carrier.

Applicants respectfully submit that although the Examiner rejects these claims based on Kitajima et al., the Examiner fails to identify where Kitajima et al. teaches or suggests a lower carrier and an upper carrier. Further, Kitajima et al. is not prior art to the present invention. Applicants respectfully submit that claim 5 and its dependent claims 6-8 are allowable over Kitajima et al.

Dependent claim 6 has been amended to clarify antecedent basis for several elements, and dependent claim 7 is not amended. Applicants respectfully submit that the amendments made do not affect the Examiner's indication of allowable subject matter in these claims.

Dependent claim 8 has been amended to describe the additional steps of generating a power distribution command based on a desired power distribution between at least the first and the second DC power sources and generating an AC voltage command based on the load; and wherein generating the voltage command includes adding the AC voltage command to the power distribution command. Since Kitajima et al. is not prior art to the present invention, claim 8 is allowable.

The Examiner rejects claim 9 and its dependent claim 12 under 35 U.S.C. § 102(a) as being anticipated by Kitajima et al. Claim 9 has been amended to clarify antecedent basis and to more particularly point out and distinctly claim the invention therein. More specifically, the method includes generating a voltage command indicative of a voltage to be applied to the load and switching a pole to be connected to the load by operating a switch between the positive pole and the negative pole of the first DC power source by comparing the voltage command with a lower carrier and operating a switch between the positive pole and the negative pole of the second DC power source by comparing the voltage command with an upper carrier.

Applicants respectfully submit that although the Examiner rejects these claims

based on Kitajima et al., the Examiner fails to identify where Kitajima et al. teaches or suggests a lower carrier and an upper carrier. Applicants further submit that Kitajima et al. is not prior art to the present invention in any case. Applicants respectfully submit that claim 9 and its dependent claims 10-12 are allowable over Kitajima et al.

Dependent claim 10 has been amended to clarify antecedent basis for several elements, and dependent claim 11 is amended to depend from claim 10, instead of from claim 9. Applicants respectfully submit that the amendments made do not affect the Examiner's indication of allowable subject matter in these claims.

Dependent claim 12 has been amended to include the steps of generating a power distribution command based on a desired power distribution between at least the first and the second DC power sources and generating an AC voltage command based on the load wherein generating the voltage command includes adding the AC voltage command to the power distribution command. Applicants respectfully submit that Kitajima et al. is not prior art to the present invention so claim 12 is allowable.

The Examiner rejects claim 13 and its dependent claims 17 and 18 under 35 U.S.C. § 102(a) as being anticipated by Kitajima et al. and rejects claim 13 and its dependent claim 18 under 35 U.S.C. §102(b) as being anticipated by Shekhawat et al. and Mikami et al. As mentioned above, Kitajima et al. is not prior art to the present invention.

Claim 13 has been amended to add the feature of a voltage command generating portion configured to generate a voltage command indicative of a voltage to be applied to each of the three terminals of the three-phase load. In addition, the switch control portion has been amended for clarification. Claim 13 describes a switch control portion configured to switch a pole to be connected to the three-phase load by operating a switch connected between the positive pole and the negative pole of the first DC power source when the voltage command is lower than an electric potential of the negative pole of the second DC power source and operating a switch connected between the positive pole and the negative pole of the second DC power source when the voltage command is higher than the electric potential of the negative pole of the second DC power source. Applicants respectfully submit that, as is clear from the descriptions of

Shekhawat et al. and Mikami et al. above, that neither of these references teach or suggest the claimed switch control portion. The invention of claim 13 and its dependent claims 14-18 is patentable over the cited references.

Dependent claims 14 and 15 have been amended to clarify antecedent basis, and claim 16 is not amended. Applicants respectfully submit that the amendments made do not affect the Examiner's indication of allowable subject matter in these claims.

Dependent claim 17 has been amended for typographical errors. Applicants respectfully submit that claim 17 is allowable based on its dependence from claim 13.

Dependent claim 18 has been amended for antecedent basis and to more particularly point out and distinctly claim the invention. Claim 18 now describes a power distribution command generating portion configured to generate a power distribution command based on a desired power distribution between the first and second DC power sources, wherein the voltage command is based on addition of the power distribution command and an AC voltage command based on the load. Neither of the references teach or suggest a voltage command generating portion configured to generate a voltage command where the voltage command is based on addition of a power distribution command and an AC voltage command based on the load. Claim 18 is thus allowable over Shekhawat et al. and Mikami et al. based on the features recited therein in addition to being allowable based on its dependence from claim 13.

Applicants respectfully submit that this Amendment has antecedent basis in the application as originally filed, including the specification, claims and drawings, and that this Amendment does not add any new subject matter to the application. Reconsideration of the application as amended is requested. It is respectfully submitted that this Amendment places the application in suitable condition for allowance; notice of which is requested.

If the Examiner feels that prosecution of the present application can be expedited by way of an Examiner's amendment, the Examiner is invited to contact the undersigned at the telephone number listed below.

Respectfully submitted,

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